



Water Wells - Planning and Design

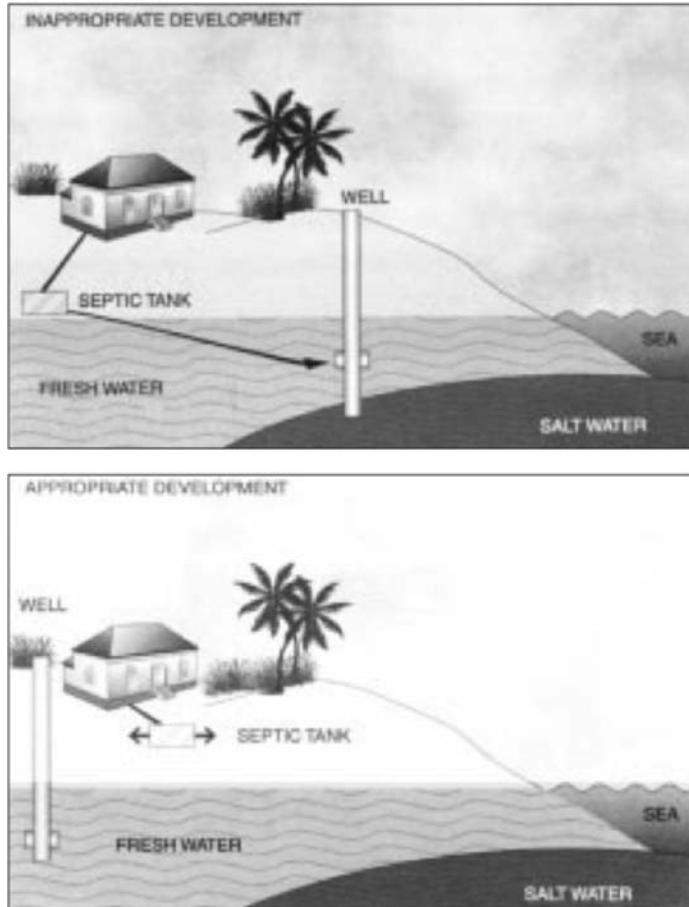
Guiding Principles

- All relevant factors should be considered in siting and design of wells and septic systems
- Consider natural or alternative sewage treatment systems in order to reduce costs and potential for contamination.
- Use closed cycle systems whereby water initially used for human consumption is recycled for use in landscaping.
- Institute water conservation techniques to decrease water use and reduce operational costs.
- Minimize hard surfaces to reduce run-off and allow for sufficient water absorption.
- Carry out a hydrological survey of water resources along the coast to establish a scientific base for planning of tourism facilities.

Technical guidance in siting and design of water wells

Knowledge of the site and careful siting and design of water delivery systems can ensure a consistent supply of fresh water and minimize potential for contamination. The following steps should be used in the planning stage:

1. *Locate water sources and determine water needs.* Identify sources of fresh water on-site or nearby and estimate demand for water during construction and operation at full capacity, taking into account seasonal fluctuations in rainfall and tourist arrivals.
2. *Identify and locate potential sources of contamination.* Possible sources include pit latrines, industrial wastewater, septic tanks, run-off during heavy rains, or fertilizers from agricultural activities.
3. *Conduct a hydrological survey prior to drilling.* This study will help determine the optimal location and depth of well or borehole. It is recommended that studies be conducted in the dry season to establish the lower limits of water availability.
4. *Design wells to eliminate intrusion of contaminants and salt water.* One inexpensive and effective method is to install a horizontal tube at the bottom of the vertical pipe. This ensures that fresh water flows horizontally into the wellhead.



*Fig. 5 Diagram of water well with horizontal tube
Siting and Design of Septic Systems*

Source: Tanzania Ministry of Natural Resources & Tourism. 2003. *Guidelines for Coastal Tourism Development in Tanzania*. Tanzania Coastal Management Partnership.